



Ethnobotanics Study of Medicinal Plants in Lardjem Region (Algeria).

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KEYWORDS

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study - Lardjem -
decoction-
digestive and
respiratory system.

ABSTRACT:

This study enabled us to make an inventory of the main medicinal plants presents in Lardjem region as well as their therapeutic uses. A series of surveys and field trips allowed us to reveal a multitude of information.

To identify the most used medicinal plants in the study area. Among the most used plants are those belonging to the families Lamiaceae and Liliaceae.

From an ethnobotanical study, young people generally do not know the names or usefulness of most medicinal plants compared to older people. Thus, that there is a large difference in the percentage of plant use by women has a contribution to men. On the other hand the foliage is the most used part and the decoction is the most practiced method. We also note that medicinal plants are widely used to treat diseases of the digestive and respiratory system.

Finally we can conclude that the mode of collection and the high use of certain species are the main factors of degradation plant resources of this region.

1. Introduction

The use of plants in medicine is very old and usually comes from the belief that they have very low toxicity due to their natural origin. Even wild animals instinctively use certain plants. According to the World Health Organization, around 80% of the world's population uses traditional medicine for health care (Gomes et al. 2012).

Ethnobotanical data estimates that more than 800 plants are used in traditional medicine for treatment (BECHIRI, A, 2016).

Medicinal plants are valuable resources for the majority of rural and urban populations in Africa and represent the main means by which people heal themselves (Badiaga, 2011). Despite progress in pharmacology, the therapeutic use of medicinal plants is very present in some countries of the world and especially in developing countries (Tabuti et al., 2003). Algeria, by the richness and diversity of its flora, constitutes a real phylogenetic reservoir, with about 4000 species and subspecies of vascular plants (Dobignard and Chatelain, 2010-2013). However, the Algerian medicinal flora remains unknown until today, because of the few thousand plant species, only 146 are counted as medicinal (Baba Aissa, 1999). Indeed, traditional

medicine has always occupied an important place in the traditions of medication.

The municipality of Lardjem (western Algeria) presents a very important floristic and faunal diversity.

For this we deemed it useful to contribute to an ethnobotanical study in the region of Lardjem for the knowledge of medicinal plants, to produce a catalog of these plants in the said region and to gather as much information as possible concerning the therapeutic uses practiced by the local population. Indeed, it is very important to translate this traditional knowledge into knowledge.

Presentation of the study area

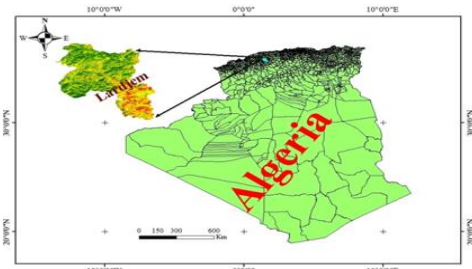
Geographical location

This study was conducted in the town of Lardjem west of the wilaya of Tissemsilt, this town covers a total area of 26600 ha. It is located between the coordinates 35° 53' 55", 35° 40' 25" North latitude and 1° 22' 43.24", 1° 36' 33.35" East longitude. It is limited to the north by the municipality of Larbaa, to the south by the municipalities of Sidi Lantri and Maacem, to the east by the municipalities of Bourdj Bounaama, Sidi Abed and Tamellahet, to the west by the wilaya of Relizane and to the south -west by the municipality of Melaab. The



forest area in this commune is 17,683.6605 ha, representing an afforestation rate of 66.48%.

Figure №01: Geographical location of the study area.



2. Objectives

For this we deemed it useful to contribute to an ethnobotanical study in the region of Lardjem for the knowledge of medicinal plants, to produce a catalog of these plants in the said region and to gather as much information as possible concerning the therapeutic uses practiced by the local population. Indeed, it is very important to translate this traditional knowledge into knowledge.

3. Methods

Survey and sampling

To highlight the importance of the floristic richness in medicinal plants of the study area and their direction of evolution as well as the main discriminating factors, we started a phytoecological diagnosis, followed by field measurements. Indeed, this simple but effective approach is very necessary to achieve our objectives.

First, we gathered all the cartographic data necessary for carrying out vegetation surveys in the studied area. Several prospecting trips were carried out in order to clarify the value of the sampling plan and concretely locate the transects to be considered. In this phase we carried out floristic surveys at a few stations.

The choice of sites was determined by superimposing three types of information, namely geomorphology, phytoecology and pedology. The number of stations depends on the change in vegetation cover.

In this study we adopted the mixed survey method (linear survey and plot).

It turns out to be the most appropriate method for a rapid biological inventory, allowing both to have data

on the floristic composition and the structure of the vegetation.

The location of the surveys was determined after a survey. They are carried out in places deemed representative, that is to say places with little disturbance, floristically and physiognomically homogeneous, and according to the topography.

In a second step, we started an ethnobotanical investigation which consists of:

- Collection of medicinal plants from the floristic procession of the main forest formations encountered
- Botanical classification and confirmation of the use of plants in traditional medicine.
- A small survey of herbalists and elderly people who are generally knowledgeable about the use of plants in traditional medicine in the Lardjem region

4. Results

4.1. Ethnobotanical survey:

Through the ethnobotanical survey conducted among the population of the study area, it turns out that there is a diversity of results linked firstly to the variability of the parameters concerning the people surveyed; age group, profession, sex, family situation and level of education.

Secondly to the diversity of parameters for the use of medicinal plants, in particular the species used, symptoms treated, parts of the plant used, doses of preparation and method of use.

The collected ethnobotanical information was recorded on raw data sheets then transferred to a database, processed and analyzed to obtain standardized data.

4.1.1- Parameters of the respondent:

4.1.1.1- Age group:

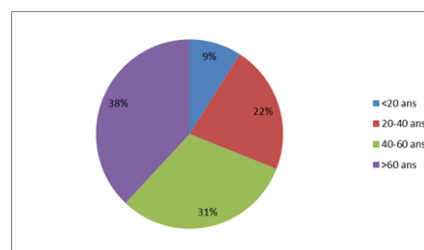


Figure 02: Use of medicinal plants according to the age of respondents.



4.1.1.2- Gender:

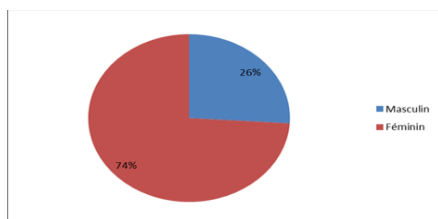


Figure 03: The use of medicinal plants according to the gender of respondents.

4.1.1.3- Academic level:

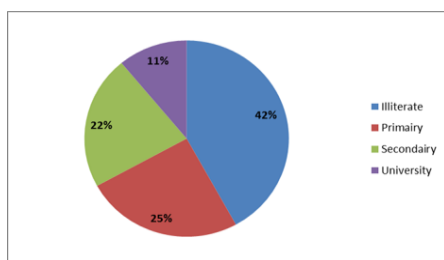


Figure 04: Use of medicinal plants according to the academic level of respondents.

4.1.1.4- Choice between phytotherapy and modern medicine:

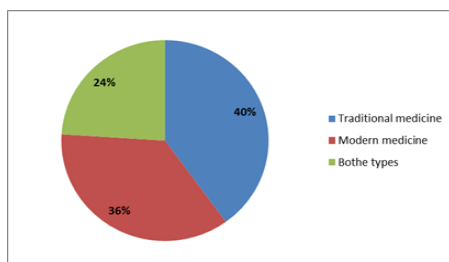


Figure 05: The choice between traditional and modern medicine among people surveyed.

4.1.2- Parameters related to the medicinal plants used:

4.1.2.1- Depending on the species used:

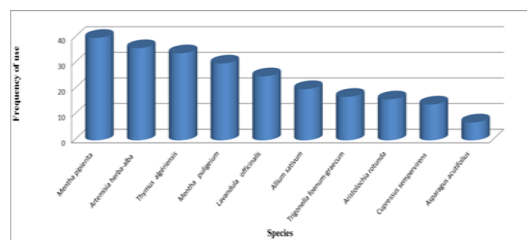


Figure 06: Classification of species according to their frequency of use.

4.1.2.2- According to the type of plant (wild, cultivated):

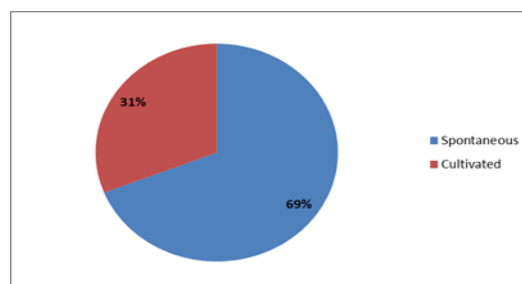


Figure 07: Frequency of use according to the type of plant.

4.1.2.3- Harvest period:

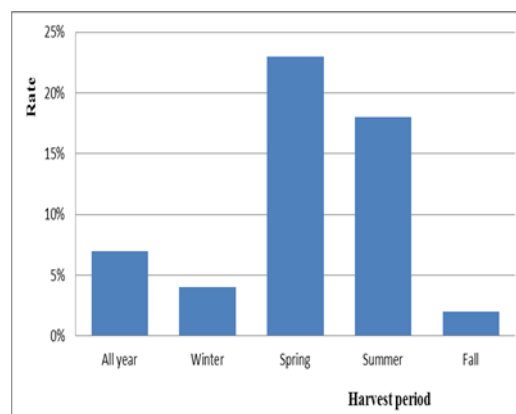


Figure 08: Use of species according to the harvest period.

4.1.2.6- Plant states:

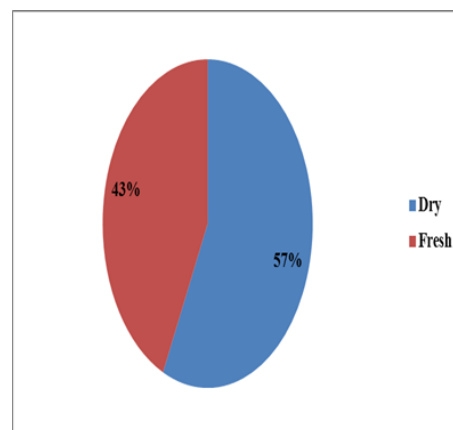


Figure 09: The state of use of medicinal plants.



4.1.2.8- Parts used:

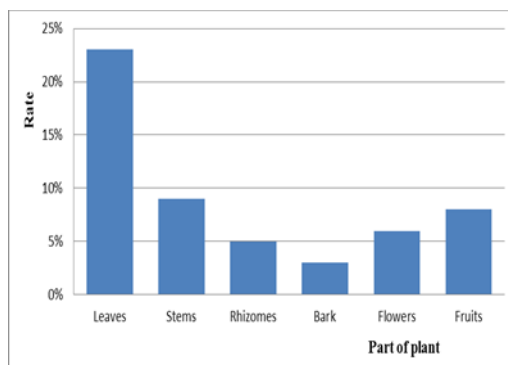


Figure 10: Rate of use of different parts of medicinal plants.

4.2- Diversity of medicinal plants used:

Table 01: Diversity of medicinal plants used.

N=°	Family	Scientific name	Parts used	How to use Indications
1	Liliaceae	<i>Scille maritime</i>	plant sap	Digestive disorders, stomach ulcers and inflammation of the intestines.
		<i>Asparagus actufolius</i>	stems, roots	Infections inflammations, minor skin lesions, burns, frostbite and dry skin.
		<i>Allium sativum</i>	Roots	Diuretic, vomiting
		<i>Allium cepa</i>	Roots	Heart fatigue, hypertension, horses digestive system.
2	Ranunculaceae	<i>Adonis vernalis</i>	flower petals	The ear, wounds, Digestive system, Respiratory system.
3	Lamiaceae	<i>Melisse officinalis</i>	leaves and flowers	Insomnia, excessive nervousness, anxiety, angina and bronchitis. Against inflammation of the eyelids.
		<i>Mentha pulegium</i>	The whole plant	Anemia, difficult digestions, and tuberculosis
		<i>Mentha pipierita</i>	The whole plant	Respiratory disorders, bronchitis and fever.
		<i>Thymus algériensis</i>	Leaves	Digestive tract cough menstruation pain diarrhea.



		<i>Lavandula officinalis</i>	The whole plant	Digestive tract + refreshing + spicy
		<i>Teucrium polium</i>	Leaves	The flu, + rheumatism, + angina
4	Apiaceae	<i>Thapsia garganica</i>	Roots and leaves	Chronic eczema, the nervous system, insomnia fevers
5	Fabaceae	<i>Trigonella foenum graecum</i>	Seeds	Healing agents + Digestive system
6	Punicaceae	<i>Punica granatum</i>	Flowers, bark, fruits	Used as ear instillation. Fresh leaves, heated and dipped in olive oil, are applied as a poultice to soothe joint pain.
7	Rhamnaceae	<i>Rhamnus alaternus</i>	Leaves	Diabetes, stomach pain
8	Cupressaceae	<i>Juniperus oxycedrus</i>	Berries, leaves, whole plant	Diarrhea, Digestive System and Asthma
		<i>Cupressus sempervirens</i>	Leaves	Hepatitis + Digestive system
9	Pinaceae	<i>Pinus halepensis</i>	Bark, resin, grains	Diabetes- rheumatism- healing (against circumcision)
10	Apocynaceae	<i>Nerium oleander</i>	Leaves	Bronchitis + inflammation of the stomach + cough - hair care
11	Tamaricaceae	<i>Tamarix gallica</i>	Aerial part	Rheumatism
12	Anacardiaceae	<i>Pistacia lentiscus</i>	Leaves	Diabetes, cancer
13	Asteraceae	<i>Silybum marianum</i>	Roots	The common cold and gastric hyperacidity
		<i>Artemisia herba-alba</i>	The whole plant	Inflammation of the stomach and colon -diarrhea-healing against burns.
		<i>Chamaemelum nobile</i>	Flowers	Cancer
		<i>Chicoree sauvage</i>	The leaves, roots	gastric pain
14	Cactaceae	<i>Opuntia ficus indica</i>	Fruits	migraine and flu + Digestive system.
15	Cistaceae	<i>Cistus albidus</i>	Leaves, roots	the urinary tract.
16	Urticaceae	<i>Urtica dioica</i>	Leaves,	Digestive



			roots	
17	Boraginaceae	<i>Borago officinalis</i>	Roots	Stomach pain- Asthma.
18	Chenopodiaceae	<i>Spinacia oleracea</i>	Leaves	Diarrhea +-rheumatism
19	Myrtaceae	<i>Eucalyptus</i>	Leaves	Obesity + Respiratory System + Kidneys
20	Thymelaeaceae	<i>Thymelaea hirsuta L.</i>	Leaves	Anemia + Digestive System
21	Malvaceae	<i>Malva sylvestris L.</i>	The leaves and roots	Diabetes, asthma, Respiratory system, coughs.
22	Poaceae	<i>Avena sativa</i>	The grains	hair + dermatoses.
23	Caryophyllaceae	<i>Paronychia argentea</i>	The leaves and flowers	Eyes, mouth, biting insects

5. Discussion

5.1 Ethnobotanical survey:

5.1.1- Parameters of the respondent:

5.1.1.1- Age group:

The use of medicinal plants in the study area is widespread among all age groups with a predominance of people over 60 years of age (38%). The age groups of 40 to 60 years old, 20 to 40 years old; come next respectively with 31%, 22%. However, people in the age group under 20 (9%) do not use traditional medicine much for their medical safety. These values confirm the results obtained in other studies on the use of medicinal plants.

The elderly are familiar with traditional herbal medicine compared to other age groups, similarly, the lack of interest in herbal medicine among people of this age group is explained by the mistrust, particularly of young people who tend to no longer believe too much in traditional medicine.

5.1.1.2- Gender:

female sex predominates with a percentage of 74%. Moreover, in the male sex this rate does

In the study area, both women and men practice traditional medicine. However, the

This is explained by the unawareness of illiterate people of the dangers caused by the irrational use of medicinal plants, other illiterates cannot precisely understand the

verbal instructions transmitted by herbalists and healers. This high rate of illiterate users of medicinal plants is a real obstacle to local development.

5.1.1.3- Academic level:

Out of all respondents, illiterates dominate with a rate of (42%). While people with only one of the primary and secondary academic levels reach rates of (25%) and (22%) respectively. Finally, among those at the university level, the rate is 11%.

not exceed 26%.

This explains why women are more concerned with phytotherapeutic treatment and the preparation of plant-based recipes, not only for themselves but also for the whole family. As he shows us that woman are more holders of traditional phytotherapeutic knowledge than men.

5.1.1.4- Choice between phytotherapy and modern medicine:

Concerning the choice of people surveyed between therapeutic practices in the study area, the results obtained show that 40% of the population use traditional medicine, while 36% prefer modern medicine and a rate of 24% of people use two at a time. This is justified by the fact that the local population is interested in traditional remedies to relieve their daily ailments.



5.1.2- Parameters related to the medicinal plants used:

5.1.2.1- Depending on the species used:

According to the results obtained from the ethnobotanical survey carried out in the study area, a list of species most used in traditional medicine and their frequency of use by the population surveyed (Fig.06) was found. results showed that among the 10 most used species, the species *Mentha pipierita* is first followed by the two species (*Artemisia herba-alba* *Thymus algériensis*), then come the other species such as *Mentha puligeium*, *Lavandula officinalis*, *Allium sativum*, *Trigonella foenum-graecum*, *Aristolochia rotunda*, *Cupressus sempervirens* according to their degree of use and lastly we have the species *Asparagus acutifolius* with a low frequency of use.

5.1.2.2- According to the type of plant (wild, cultivated):

The ethnobotanical survey shows us that spontaneous plants are widely used with 69% of the total species. This is due to their year-round availability. Unlike the cultivated ones which only reach utilization rate of around 31%.

5.1.2.3- Harvest period:

The results of our survey in the study area show that the harvest of certain species usable in traditional medicine can be throughout the year while for others is distributed according to the seasons, noting that spring and summer come at first place while winter and fall record minority harvest rates.

5.1.2.6- Plant states:

According to the results obtained, it was found that 57% of the medicinal species are used in the dry state; they constitute the basis of herbal teas, powders and extracts usable in traditional medicine. On the other hand, 43% of the species are used fresh; they are mainly used in the preparation of mother tinctures, poultices and soups.

5.1.2.8- Parts used:

The results of our ethnobotanical survey revealed that the foliage is the most used part in the study area with a rate of (23%), followed by stem (09%), then the fruits (08%), the flowers (06%), while the rhizomes and the

other parts of the plants (twig, bud, bark) are used with low rates respectively (05%) and (03%).

This difference in proportions in the used parts of the plant is justified by the variability of concentration of active substances in each organ. The dominance of the leaves is justified by the fact that they are the site of the majority of the photochemical reactions and considered as a reservoir of the organic matter that derives from them. The leaves provide the majority of the alkaloids, glycosides and essential oils.

The importance of fruits is due to the concentrations of their substances carbohydrates and aromatics associated with certain pigments which give them a characteristic coloring. The use of flowers is due to their richness in oil Essential. The same is true for roots and seeds rich in sugars and vitamins.

The harvesting of these organs is done in an arbitrary way by the local population who ignores the phenological phases, leafing, flowering and fruiting, which consequently exerts a strong pressure of harvesting leading to the decrease in productivity, reduction and loss of the biodiversity. This way of harvesting leads to the rarefaction, or even the risk of the total disappearance of certain species.

5.2- Diversity of medicinal plants used:

The results obtained are listed in Table01. according to therapeutic practices, use of plants as well as the treatment of diseases. All the medicinal species identified are represented in the form of a catalog.

The analysis of the results was based on the vernacular name of the plants; all the plants thus identified are well known in the traditional Algerian pharmacopoeia and are used in the region of Lardjem for therapeutic purposes.

Conclusion

Despite the development of the drug industry of chemical origin, traditional herbal medicine is currently a source of remedy par excellence. The latter is widely distributed among populations who trust popular medical use and do not have the means to bear the costs of modern medicine. Indeed, phytotherapy plays a very important role in the modern therapeutic field, by constituting a database through ethnobotanical study.



The latter is rich in empirical knowledge resulting from the experiences of men.

Thus, the present study has made it possible to carry out the most complete inventory possible of the medicinal plants used in an area which is part of the Aurès region of Algeria and to gather information concerning the therapeutic uses practiced in this area.

The ethnobotanical survey revealed a multitude of results. About 35 medicinal plant species are reported, divided into 23 families, of which the most used species is the *Mentha piperita*, and the most represented family is Lamiaceae.

The people surveyed are mostly over 60 year's old, illiterate, married and have no profession. Also, medicinal plants attract much more attention from women who know their value and therapeutic effects better than men.

The use of spontaneous medicinal plants dominates that of cultivated plants and most of these plants are harvested manually, especially in spring. In addition, the majority of medicinal plants are used alone without association with other plants, generally in a dry state.

The leaves are the most used part and most recipes are prepared mainly with non-specific doses in the form of an infusion. These doses vary according to age, of which the daily dosage for adults is the most numerous.

These plant-based recipes are administered orally, especially in the form of herbal tea. Thus, the distribution of the frequency of use of medicinal plants according to the group of diseases treated shows that digestive disorders are the major therapeutic indications. The most commonly used duration of treatment corresponds to a week. The use of herbal medicine is not devoid of certain risks due to the toxicity of certain plants, which requires taking precautions for use.

Similarly, the collection and analysis of the data collected have made it possible to transform popular oral knowledge in this region into transcribed knowledge by establishing a catalog of the medicinal plants used and their therapeutic use.

Indeed, it is necessary and important to safeguard the phytotherapeutic knowledge of the Aurès population in

Algeria because they are part of the national heritage which deserves to be valued.

Moreover, these results can be considered as a source of information for scientific research in the field of phytochemistry and pharmacology with a view to finding new active principles based on plants.

Medicinal plants still remain the reliable source of active ingredients known for their therapeutic properties.

As well as they must have, like medicines, strict standard rules that only the specialist in herbal medicine can meet.

Finally, more importance must be given to the cultivation, exploitation and marketing of these plants, which can be an important source of external income.

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